

April 1904. Dr. Downing, Brünnow's "*Tafeln der Flora*." 553

When observers on the same night differ in the estimated time of passage fifteen or twenty minutes, it is evident that the method is not a good one. Observers who have no driving clock or micrometer must necessarily do the best they can, but it ought to be evident to every working astronomer that the quality of the work cannot be the same for all instruments.

Dearborn Observatory of North-Western University :
1904 April 2.

Corrected Continuation of Brünnow's "Tafeln der Flora."
By A. M. W. Downing, D.Sc., F.R.S.

The materials collected in this paper are intended for the convenience of astronomers who may wish to use the corrected elements of *Flora*, published in *Monthly Notices*, vol. lii. p. 590, in combination with Brünnow's Tables, for the purpose of computing an ephemeris. By means of the continuations or modifications of certain of the tables, or of parts of them, here given, the necessary computations can be made with facility for the period 1904-1911.

From an observation of the planet made by Mr. Tebbutt at Windsor, N.S.W., on 1902 July 27, and published in *Astron. Nachrichten*, No. 3856, I find the correction to the place of *Flora*, computed in the manner indicated above, to be

in R.A. $-3^s.85$, and in Decl. $-13''.3$.

Continuation of Brünnow's Tafel I., "Argumente für die Jahre."

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.
B. 1904	100.83	13.06	113.90	214.74	188.63	87.8	126.9	289.4	315.6	285.3	298.4	140.0	276.4	311.3
1905	180.65	342.73	163.39	344.05	18.59	197.9	146.1	199.2	164.7	144.8	127.6	128.9	216.5	110.2
1906	260.47	312.40	212.88	113.36	208.55	165.2	308.1	108.9	13.8	4.4	316.8	117.7	156.6	269.1
1907	340.29	282.08	262.38	242.67	38.51	58.2	184.4	18.7	223.0	223.9	146.0	106.6	96.7	68.0
B. 1908	60.33	251.67	312.01	12.34	228.99	168.7	203.6	289.3	72.6	83.1	334.8	95.4	37.6	226.3
1909	140.15	221.34	1.50	141.65	58.95	278.8	222.8	199.1	281.7	302.6	164.0	84.3	337.8	25.2
1910	219.97	191.02	50.99	270.96	248.91	28.9	242.0	108.9	130.9	162.1	353.2	73.1	277.9	184.1
1911	299.79	160.70	100.49	40.28	78.88	139.1	261.2	18.7	340.1	21.6	182.3	61.9	218.0	343.0
B. 1904	30.4	131.1	56.5	328.6	4.2	118.2	224.0	136.2	0.3	136.6	224.4	311.8	48.4	175.9
1905	20.0	200.5	345.5	147.4	54.4	217.9	321.9	124.0	86.0	210.1	48.0	159.9	286.0	121.9
1906	9.6	270.0	274.4	326.2	104.7	317.7	59.9	111.8	171.7	283.6	231.7	8.0	163.6	67.9
1907	359.2	339.4	203.4	145.0	154.9	57.4	157.8	99.6	257.4	357.1	55.3	216.1	41.2	13.9
B. 1908	349.8	49.9	133.2	324.3	206.2	158.5	255.9	87.3	343.5	70.8	239.5	64.6	278.5	320.8
1909	339.3	119.3	62.1	143.1	256.5	258.2	353.8	75.1	69.2	144.3	63.1	272.7	156.2	266.8
1910	328.9	188.8	351.0	321.9	306.8	357.9	91.8	62.9	154.9	217.8	246.8	120.8	33.9	212.7
1911	318.5	258.2	279.9	140.7	357.1	97.5	189.8	50.7	240.5	291.3	70.4	328.9	271.6	158.7

In the formation of these arguments the mean anomalies of *Flora* have been computed from the corrected elements. The mean anomalies of *Jupiter* and *Saturn* have been taken from Le Verrier's Tables, and are corrected for the great inequality.

Table to be substituted for the First Part (p. 6) of Brünnow's *Tafel IV.*,
"Für die mittlere Anomalie."

	M.	<i>t.</i>
B. 1904	87° 47' 23''68	+ 55'998
1905	197 55 57'11	+ 56'997
1906	308 4 30'54	+ 57'997
1907	58 13 3'97	+ 58'996
B. 1908	168 39 43'74	+ 59'998
1909	278 48 17'17	+ 60'997
1910	28 56 50'60	+ 61'997
1911	139 5 24'03	+ 62'996

	M	<i>t.</i>
January ...	0° 0' 0''00	0'000
February ...	9 21 16'48	+ 0'085
March ...	17 48 13'95	+ 0'162
April ...	27 9 30'43	+ 0'246
May ...	36 12 40'58	+ 0'329
June ...	45 33 57'06	+ 0'413
July ...	54 37 7'21	+ 0'496
August ...	63 58 23'69	+ 0'580
September ...	73 19 40'17	+ 0'665
October ...	82 22 50'32	+ 0'747
November ...	91 44 6'80	+ 0'832
December ...	100 47 16'95	+ 0'915

Days.	M.	<i>t.</i>
1	0° 18' 6''34	+ 0'003
2	0 36 12'68	+ 0'005
3	0 54 19'01	+ 0'008
4	1 12 25'35	+ 0'011
5	1 30 31'69	+ 0'014
6	1 48 38'03	+ 0'016
7	2 6 44'37	+ 0'019
8	2 24 50'71	+ 0'022
9	2 42 57'04	+ 0'025
10	3 1 3'38	+ 0'027
20	6 2 6'76	+ 0'055
30	9 3 10'14	+ 0'082

R R

In bissextile years (marked B above) subtract one day from the date during January and February.

Corrections to Brünnow's Tafel V., "Für die Mittelpunkts Gleichung," and Tafel VI., "Für den elliptischen Radius Vector."

M.	$\Delta(v-M).$	$\Delta \log r.$	M.	$\Delta(v-M).$	$\Delta \log r.$
0	0'00	+27	90	-3'50	-29
1	-0'06	+27	95	-3'42	-32
5	-0'49	+26	100	-3'33	-34
10	-0'97	+25	105	-3'17	-37
15	-1'42	+23	110	-2'97	-40
20	-1'85	+21	115	-2'77	-40
25	-2'24	+18	120	-2'57	-40
30	-2'59	+15	125	-2'37	-41
35	-2'89	+11	130	-2'17	-43
40	-3'15	+7	135	-1'96	-46
45	-3'38	+3	140	-1'75	-49
50	-3'60	-2	145	-1'54	-49
55	-3'70	-5	150	-1'33	-49
60	-3'73	-8	155	-1'12	-49
65	-3'74	-11	160	-0'91	-50
70	-3'75	-15	165	-0'70	-50
75	-3'69	-20	170	-0'48	-50
80	-3'63	-24	175	-0'25	-51
85	-3'57	-26	180	0'00	-51

These corrections reduce the equation of the centre and the log radius vector, taken from Brünnow's Tables, to the corresponding values deduced from the corrected elements.

The corrections for intermediate values of M can be found with sufficient accuracy by interpolation.

When M is greater than 180° the argument is $360^\circ - M$. In this case the sign of $\Delta(v-M)$ must be changed, but the sign of $\Delta \log r$ remains unchanged.

The values of $\Delta \log r$ are expressed in units of the seventh decimal.

Continuation of Brünnow's Tafel XIV., "Für die Constanten in Bezug auf den Aequator."

	A.		B.		C.		log a.	log b.	log c.	log cos a.	log cos b.	log cos c.
	°	'	°	'	°	'						
1904	123 38	45.49	35 47	9.86	19 53	6.24	9.9980036	9.9694658	9.5735743	8.98075	9.55892 ⁿ	9.96717
1905	123 39	35.90	35 47	58.99	19 53	57.99	9.9980040	9.9694696	9.5735477	8.98071	9.55890 ⁿ	9.96717
1906	123 40	26.30	35 48	45.12	19 54	49.74	9.9980044	9.9694734	9.5735211	8.98067	9.55887 ⁿ	9.96717
1907	123 41	16.71	35 49	37.25	19 55	41.50	9.9980047	9.9694772	9.5754945	8.98063	9.55885 ⁿ	9.96718
1908	123 42	7.25	35 50	26.52	19 56	33.40	9.9980051	9.9694811	9.5734678	8.98058	9.55882 ⁿ	9.96718
1909	123 42	57.65	35 51	15.65	19 57	25.17	9.9980055	9.9694849	9.5734412	8.98054	9.55880 ⁿ	9.96718
1910	123 43	48.06	35 52	4.79	19 58	16.94	9.9980059	9.9694887	9.5734145	8.98050	9.55878 ⁿ	9.96719
1911	123 44	38.46	35 52	53.93	19 59	8.71	9.9980063	9.9694925	9.5733878	8.98046	9.55876 ⁿ	9.96719

These quantities have been computed from the corrected elements, and the values of A, B, and C modified by the subtraction of a constant ($9' 46'' \cdot 5$) from each, so as to be applicable to the perturbed true anomalies when the perturbations are taken from Brünnow's Tables.

H.M. Nautical Almanac Office :
1904 March 31.

*Observations of the Minor Planet (324) Bamberga at Windsor,
New South Wales. By John Tebbutt.*

The observations were made with the 8-inch equatorial and its filar micrometer in a bright field. The following notes were made with reference to the planet's magnitude :

August 12 : Magnitude about 8.0. August 17 : Apparently brighter than on previous occasions. August 20 : Certainly did not exceed $8\frac{1}{2}$ magnitude. August 29 : Planet and comparison star exactly equal. September 1 : Much brighter than comparison star and of $8\frac{1}{2}$ magnitude. September 3 : Planet slightly brighter than comparison star. September 4 : Considerably less than star. September 5 : Very much inferior to star. September 7 : Planet becoming fainter. September 14 : Slightly less than star. September 21 : Equal to $8\frac{1}{2}$ magnitude.